1981

Dickey-Lincoln School Lakes Transmission Project: Final Environmental Impact Statement: Appendix L

New England Division

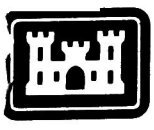
United States Army Corps of Engineers

United States Department of Energy

ENVIRONMENTAL IMPACT STATEMENT
APPENDIX L
FINAL SUPPLEMENT
TRANSMISSION PROJECT
D.O.E.
MAINE, NEW HAMPSHIRE & VERMONT

Dickey-Lincoln School Lakes

JUNE 1981



US Army Corps
of Engineers

DOE EIS-0008-DS

FINAL
ENVIRONMENTAL IMPACT STATEMENT
SUPPLEMENT

DICKEY-LINCOLN SCHOOL LAKES
TRANSMISSION PROJECT

Prepared by

U.S. Department of Energy
Federal Office Building
Bangor, Maine 04401

Summary

SUMMARY

DICKEY-LINCOLN SCHOOL LAKES TRANSMISSION PROJECT

( ) DRAFT (SUPPLEMENT) (X) FINAL ENVIRONMENTAL STATEMENT

Responsible Office: Department of Energy
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208
Attention: Mr. Timothy J. Murray
1-503-234-3361 x4611

1. Type of Action: (X) ADMINISTRATIVE ( ) LEGISLATIVE

2. Description of Action: The proposed action is the construction of: a steel double-circuit 345-kV transmission line from Moore Substation near Littleton, New Hampshire, to Comerford Substation near Monroe, New Hampshire; a 345-kV wood pole transmission line from Comerford Substation to Webster Substation near Franklin, New Hampshire. The total length of the proposed line is 73.8 miles. Sixty-nine (69) miles of the proposed line would be built on existing cleared right-of-way owned by the New England Power Company, assuming that final agreement with the company will accord with our established preliminary arrangements. It has not been determined what organization would construct the different facilities required to integrate the generation into NEPOOL. For the purposes of this impact statement, it is assumed that the Federal Government would construct, operate, and maintain the facilities.

3. Summary of Environmental Impacts: The proposed action would commit a total of approximately 55 acres of land to right-of-way expansion. Forty-five acres of forest cover would be removed from production, representing an estimated annual loss of 30 cords of timber growth. The equivalent annual stumpage value is $465.00; the resultant tax loss is $46.00.

One residence east of the Webster Substation may have to be relocated. The route will cross approximately 5 acres of agricultural land.

A total of 51 streams and 13 wetlands may be affected by increased sedimentation during the construction phase. Ledges exibiting potential rare plant habitat qualities are crossed at a number of points along 11 miles of the proposed route. Of special concern is a peregrine falcon reintroduction site near the northwestern route corridor which could be adversely impacted by the facility.

Numerous linear recreational resources are crossed by the proposed route. Most significant among these is the crossing of the Appalachian Trail and of its proposed relocation in the vicinity of Lake Tarleton and Mt. Mist. Rivers crossed include the Ammonoosuc, the Smith, and the South Branch of the Baker River, all designated potential State Recreational or Scenic Rivers. Five highways crossed are designated fall-foliage, scenic, sightseeing, and/or bicycle routes. The proposed route also traverses nearly 9 miles of the White Mountain National Forest and its Proclamation Area, but within an existing right-of-way.

The proposed 165-foot high double-circuit steel towers will have high visual impacts on residential, scenic, and recreational resources along 6.5 miles of the proposed route in the vicinity of the Moore and Comerford Reservoirs. Some visual impact will occur in the vicinity of Boston Hill and along the eastern slope of Flag Pole Hill near the Webster Substation.

A direct impact on the remains of an old stone foundation wall, a potential archeological site which lies along the centerline just west of Wentworth, can be avoided by proper location of the line structures.

4. Alternatives Considered:

   a. Alternative of not building the transmission lines
   b. Alternative of use of existing transmission system
   c. Alternative transmission routes
   d. Alternative types of tower and reconductoring

5. Draft Supplement made available to Environmental Protection Agency and the public: _____

6. Comments Requested From:

Advisory Council on Historic Preservation
Department of Agriculture
Department of Commerce
Department of Defense
Department of Health and Human Services
Department of Housing & Urban Development
Department of Interior
Department of State
Department of Transportation
Environmental Protection Agency
Federal Energy Regulatory Commission,
Inland Water Directorate, Environment Canada
Interstate Commerce Commission
U.S. Army Corps of Engineers, New England Division
U.S. Forest Service, White Mountain National Forest
U.S. Geological Survey

Maine State Clearinghouse Coordinator, A-95
New Hampshire Coordinator of Federal Funds
Vermont State A-95 Coordinator
Massachusetts A-95 Coordinator, Boston, MA.

NOTE: The above State A-95 Clearinghouses forward requests for comments to all appropriate State Offices and coordinate State agency review of Draft EIS.

Maine State Historic Preservation Commission
New Hampshire Division of Historic Preservation
Vermont Division of Historic Preservation

Androscoggin Regional Planning Commission, ME.
North Kennebec Regional Planning Commission, ME.
Northern Maine Regional Planning Commission, ME.
Penobscot Valley Regional Planning Commission, ME.
North Country Council, NH.
Lakes Region Planning Commission
Central New Hampshire Regional Planning Commission
Central Vermont Planning Commission, VT.
Chittenden County Regional Planning Commission, VT.
Northeast Vermont Development Association, VT.

NOTE: The Regional Planning Commissions above act as area-wide A-95 Coordinators. As such, they forward requests for comments to appropriate towns and local agencies and coordinate Draft EIS review. All organized towns along the alternative routes are included in this review process.

Boise Cascade Corp., Rumford, ME.
Brown Paper Company, Berlin, NH.
Dead River Company, Bangor, ME.
Diamond International Corp., Old Town, ME.
Dunn Heirs, Ashland, ME.
G. Pierce Webber, Bangor, ME.
Georgia Pacific Corp., Woodland, ME.
Great Northern Paper Co., Millinocket, ME.
J.M. Huber Corp., Old Town, ME.
International Paper Co., Jay, ME.
St. Regis Paper Co., Bucksport, ME.
Scott Paper Co., Winslow, ME.
Seven Islands Land Co., Bangor, ME.
James W. Sewall Company, Old Town, ME.

Associated General Contractors of Maine

Business & Industry Association of New Hampshire
Carpenter's Local 621, Brewer, ME.
Economic Resources Council, ME.
Industrial Development Council of Maine
International Brotherhood of Electrical Workers, MA.
Maine AFL-CIO
Maine Electric Cooperative Association
Maine Citizens for Dickey-Lincoln
Maine State Chamber of Commerce, Portland, ME.
Valley Residents Against Dickey-Lincoln, Ft. Kent, ME.
Vermont State Chamber of Commerce

American Rivers Conservation Council, D.C.

Maine Association of Conservation Commissions
Maine Forest Products Council, ME.
Massachusetts Division of Water Pollution Control
New England Governor's Conference, MA.
New England Regional Commission, MA.
New England River Basins Commission, MA.
Federal Regional Council of New England
New Hampshire Association of Conservation Commissions
Office of Legislative Research, Hartford, CT.
Society of American Foresters, ME.

American Association of University Women, ME.
Audubon Society of Maine
Audubon Society of New Hampshire
Appalachian Mountain Club, MA.
Appalachian Mountain Club, NH.
Bates Outing Club, ME.
Colby Environmental Council, ME.
Northwestern University Center for Urban Affairs
Connecticut River Watershed Council
Conservation Law Foundation of New England, MA.
Conservation Society of Vermont
Dartmouth College, Hanover, NH.
Environmental Defense Fund
Dartmouth Outing Club, NH.
Environmental Coalition
Friends of the St. John, MA.
Friends of the Earth
Forum on New Hampshire Future
Institute of Natural and Environmental Resources,
Univ. of N.H., Durham, NH.
Izaak Walton League of America
Garden Club Federation, ME.
Grafton County Soil Conservation District

Green Mountain Club, VT.
Harvard Environmental Law Society
Land Use Foundation of New Hampshire
Land & Waters Resources Institute, UM-Orono, ME.
League of Women Voters, ME.
Maine Public Interest Research Group
Maine Association of Planners
Maine Archeological Society
Legislative Utility Conservation Council
Midcoast Audubon Society, ME.
National Audubon Society, Inc., Washington, D.C.
National Wildlife Federation, Washington, D.C.
Nature Conservancy, MA.
Nature Conservancy, NH.

National Parks and Conservation Association
Natural Resources Council of Maine
Natural Resources Council of Vermont
New England Forestry Foundation, Inc.
New Hampshire Farm Bureau
New Hampshire Snowmobiling Association
New Hampshire Planner's Association
New England Natural Resources Center, MA.
New Hampshire Wildlife Federation, NH.
Penobscot Paddle & Chowder Society, ME.
Sierra Club, MA.
Simon's Rock Early College, ME.
Society for Protection of New Hampshire Forests
SPACE: Statewide Program to Conserve Our Environment, NH.
Sportsman Alliance, Gardiner, ME.
Sunkhaze Chapter of Trout Unlimited, Bangor, ME.
The Association of Aroostook Indians, Inc.
Timberland Owners Association
United Fly Tyers, Inc.
Unity College, ME.
Wildlife Management Institute

Bangor Hydroelectric Company
Boston Edison Company, MA.
Central Maine Power Company
Eastern Maine Electric Coop.
Eastern Utilities Associates Service Corporation, MA.
Fitchburg Gas and Electric Light Co., MA.
Green Mountain Power Corp., VT.
Maine Public Service Company
Massachusetts Municipal Wholesale Electric Company, MA.
Municipal Electric Association of Vermont
New England Electric Gas and Electric Associates, MA.
New England Electric Service, MA. (NEES)
New England Power Company
New England Power Planning, MA.
New Hampshire Electric Cooperative
Newport Electric Corporation, RI.
Northeast Public Power Association, MA.
Northeast Utilities Service Co., CT. (NESCO)
Public Service Co. of New Hampshire
United Illuminating Company, New Haven, CT. (EUA)
Vermont Electric Power Company
Debouoise and Liberman
Mr. Charles Dibner
Mr. Frank Christ
Maine Public Service Company, ME.
Chas. T. Main, Inc.
Mr. and Mrs. Brian Pinette

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Preface

PREFACE

This draft EIS Supplement describes the environmental impacts of updated transmission plans of the Department of Energy (DOE) for the proposed Dickey-Lincoln School Lakes Project. Energy produced by the project is to be integrated into the New England electric system if the project is constructed.

A draft EIS for the project, including the dams, powerhouses, reservoirs, dikes, etc., has been completed by the U.S. Army Corps of Engineers and filed with the Environmental Protection Agency (EPA). DOE has completed a draft EIS on the transmission facilities and filed it with the EPA in April 1978. The Corps' draft statement and the DOE draft will be combined into a single, joint final EIS for the project and the associated transmission facilities. The final EIS is to be filed with EPA in August 1980. The Corps' draft EIS is supported by 10 appendices. Copies of the Corps' draft and its appendices have been distributed throughout the six New England states and may be read at designated repositories.

Copies of this draft EIS supplement for a portion of the transmission facilities associated with the project, together with its 9 appendices, have been placed in the same repositories as well as in repositories in several other communities where the impacts are of interest. These places include:

	REPOSITORIES
Connecticut	
Hartford	State Library
Storrs	University of Connecticut
Maine	
Allagash	Town Hall
Ashland	Town Council
Auburn	Androscoggin Regional Planning Commission
Augusta	Natural Resources Council
Augusta	State House Law and Legislative Library
Bangor	Department of Energy - Federal Office Building
Bangor	Penobscot Valley Regional Planning Commission
Bangor	Public Library
Biddeford	McArthur Public Library
Brunswick	Bowdoin College - Longfellow Library
Caribou	Northern Maine Regional Planning Commission
Castine	Maine Maritime Academy - Nutting Memorial Library
Farmington	University of Maine
Fort Kent	Chamber of Commerce
Fort Kent	University of Maine
Jackman	Town Hall
Lewiston	Bates College
Machias	University of Maine - Merrill Library
Madawaska	First Selectman

Orono	University of Maine - Raymond H. Fogle Library
Portland	Portland Public Library
Portland	University of Maine - Documents Department
Portland	University of Maine - Law Library
Portland	University of Maine - Acquisitions Librarian
Portland	University of Maine - Center of Research - Advanced Study
Presque Isle	University of Maine
Springvale	Nasson College - Anderson Learning Center Library
St. Francis	First Selectman
Unity	Unity College
Waterville	Colby College - Miller Library
Waterville	Public Library
Winslow	North Kennebec Regional Planning Commission

Massachusetts

Amherst	University of Massachusetts
Boston	Boston Public Library
Boston	Department of Energy
Boston	State Library - Fingold Library
Cambridge	Harvard Graduate School of Design - Gund Hall
Cambridge	Harvard - Widener Library
Cambridge	Massachusetts Institute of Technology
Chestnut Hill	Boston College - Babst Library
Lowell	University of Lowell - Alumni Memorial Library
Waltham	Brandeis University - Goldfarb Library
Waltham	U.S. Army Corps of Engineers
Worcester	Worcester Polytechnical Institute - Gordon Library

New Hampshire

Bow	Central New Hampshire Regional Planning Commission
Concord	State Library
Durham	University of New Hampshire - Ezekiel W. Dimond Library
Franklin	Public Library
Franconia	North Country Council
Groveton	Public Library
Hanover	Dartmouth College - Baker Library
Hudson	Hills Memorial Library
Laconia	White Mountain National Forest
Laconia	City Library
Littleton	City Library
Manchester	City Library
Meredith	Lakes Region Planning Committee
Plymouth	Plymouth State College

Rhode Island		
	Kingston	University of Rhode Island
	Providence	Brown University
	Providence	State Library
Vermont		
	Burlington	University of Vermont - Guy W. Bailey Memorial Library
	Essex Junction	Chittenden County Regional Planning Commission
	Montpelier	State Library
	Montpelier	Vermont Free Library
	South Royalton	Vermont Law School
	St. Johnsbury	Northeast Vermont Development Association
	St. Johnsbury	St. Johnsbury Athenaem

Individual appendices for this environmental impact statement are available in limited quantities. They may be obtained by written request to:

Timothy J. Murray
Department of Energy
Bonneville Power Administration, ETMC
P. O. Box 3621
Portland, Oregon 97208

Section 1

Description of the Proposal

1.0 DESCRIPTION OF THE PROPOSAL

1.01 Introduction

The Department of Energy (DOE), as a cooperating agency with the U.S. Army Corps of Engineers, is responsible for the engineering, environmental, and economic studies for alternative transmission plans for the proposed Dickey-Lincoln School Lakes hydroelectric project in northern Maine.

DOE filed a draft Environmental Impact Statement (EIS) with the Environmental Protection Agency (EPA) on April 1, 1978, held three series of public meetings in the region, received comments, and made appropriate changes in the draft EIS. A summary of material in the DOE studies was included by the U.S. Army Corps of Engineers in the final project EIS. That EIS was to be filed with EPA in the fall of 1978. (See Table 1.01-1 for a complete list of documents prepared by both the Department of Energy and the U.S. Army Corps of Engineers.) Circumstances related to fish and wildlife mitigation planning for the project changed the scheduled filing date to August 1980. Construction of the project could then start in FY 1983.

This construction delay necessitated a DOE review of the adequacy of previous power system planning studies which identified the proposed "plan of service." That plan was chosen in 1977, based on studies and system assumptions (loads, resources, and transmission system) current for the region in 1974. Since then, load estimates have substantially decreased and generation assumptions have changed. Additional load flow studies have been made by DOE and NEPLAN in 1979 and 1980 to verify the plan-of-service decision. These studies use system assumptions for load and generation that are consistent with current regional forecasts.

These studies have demonstrated that a change in the transmission plan-of-service is necessary. The change consists of the addition of a 345-kV transmission line from the Moore Substation near Littleton, New Hampshire, to the Webster Substation near Franklin, New Hampshire, in lieu of the 345-kV line in the previous plan from Granite Substation near Montpelier, Vermont, to Essex Substation near Burlington, Vermont.

This draft EIS Supplement was prepared by the DOE to discuss the impacts of and alternatives to the above plan of service addition and change. Granite-Essex line impacts will not occur because that line segment will not be built. The changed plan of service will probably decrease substantially the total environmental impact from the transmission facilities because an already cleared right-of-way will be used for over 90 percent of the new transmission route. Transmission impacts for the entire Dickey-Lincoln School integration project are adequately treated in the April 1978 draft EIS. That document is referenced where appropriate. This document has been filed with the EPA as a Supplement to the Final EIS prepared by the U.S. Army Corps of Engineers.

TABLE 1.01-1 - ENVIRONMENTAL IMPACT STATEMENT DOCUMENTS
DICKEY-LINCOLN SCHOOL LAKES PROJECT

U.S. Department of Energy

Draft Supplement Environmental Impact Study - Transmission Line		-DOE, 1980
Appendix A	Transmission Planning System Supplement	-DOE, 1980
Appendix D	Transmission Reconnaissance Study Supplement	-DOE, 1980
Appendix E	Ecological Resources Impact Study Supplement	-DOE, 1980
Appendix F	Geotechnical Impact Study Supplement	-DOE, 1980
Appendix G	Land Use Impact Study Supplement	-DOE, 1980
Appendix H	Socioeconomic Impact Study Supplement	-DOE, 1980
Appendix I	Visual-Recreation Resources Impact Study Supplement	-DOE, 1980
Appendix J	Historical-Archeological Impact Study Supplement	-DOE, 1980
Appendix K	Map Volume Supplement	-DOE, 1980

U.S. Army Corps of Engineers

Draft Supplement Environmental Impact Statement		- CE, 1980
Appendix K	Fish and Wildlife Mitigation Plan	- CE, 1980
Appendix C	Supplement No. 2	- CE, 1980
Appendix J	Supplement No. 2	- CE, 1980
Fish and Wildlife Mitigation Report with Attachments 1, 2, 3		- CE, 1980

U.S. Army Corps of Engineers

Revised Draft Environmental Impact Statement		- CE, 1978
Volume 1 - Summary Document		
Volume 2 - Comment and Response		
Volume 3 - Comments Received on Draft EIS		
Appendix C	Supplement	- CE, 1978
Appendix E	Supplement	- CE, 1978
Appendix F	Supplement	- CE, 1978
Appendix G	Revised	- CE, 1978
Appendix I	Supplement	- CE, 1978
Appendix J	Supplement	- CE, 1978
Addenda and Errata		- CE, 1978
Supplement to Draft EIS for Transmission Lines prepared by the Department of Energy		-DOE, 1978

U.S. Department of Energy

Draft Environmental Impact Impact Study-Transmission Line		-DOE, 1978
Appendix A	Transmission System Planning	-DOE, 1978
Appendix B	Alternative Power Transmission Corridors (4 Vol.)	-DOE, 1978
Appendix C	Transmission Planning Summary	-DOE, 1978
Appendix D	Transmission Reconnaissance Study	-DOE, 1978
Appendix E	Ecological Resources Impact Study (2 Vol.)	-DOE, 1978
Appendix F	Geotechnical Impact Study (2 Vol.)	-DOE, 1978
Appendix G	Land Use Impact Study (2 Vol.)	-DOE, 1978

Appendix H	Socioeconomic Impact Study	-DOE, 1978
Appendix I	Visual-Recreation Resources Impact Study (2 Vol.)	-DOE, 1978
Appendix J	Historical-Archeological Impact Study (2 Vol.)	-DOE, 1978
Facilities Location Maps		-DOE, 1978
Errata Sheets		-DOE, 1978

U.S. Army Corps of Engineers

Draft Environmental Impact Statement-Corps of Engineers		- CE, 1977
Appendix A	Geology and Seismology	- CE, 1977
Appendix B	Climate and Atmosphere	- CE, 1977
Appendix C	Social and Economic Assessment	- CE, 1977
Appendix D	Cultural Resources Management	- CE, 1977
Appendix E	Aquatic Ecosystem and Fisheries Studies	- CE, 1977
Appendix F	Terrestrial Ecosystems Analysis	- CE, 1977
Appendix G	Recreation Resources	- CE, 1977
Appendix H	Noise Impact Assessment	- CE, 1977
Appendix I	Alternatives Study	- CE, 1977
Appendix J	Coordination With Other Agencies and Public Involvement	- CE, 1977
Design Memorandum No. 2	Hydrology and Hydraulic Analysis Sections I & II	- CE, 1977
Design Memorandum No. 3	Hydropower Capacity and Project Economics	- CE, 1977
Design Memorandum No. 4A	General Design (Revised) (Vol. I & II)	- CE, 1977
Design Memorandum No. 5	Water Quality	- CE, 1977

1.01.1 Description of the Dickey-Lincoln School Lakes Project

The main purpose of the Dickey-Lincoln School Lakes Project is to generate electricity to help meet future needs of New England consumers. The project, located in northern Aroostook County, Maine, on the St. John River near the Canadian border, would be financed by the Federal Government.

The power plant at Dickey would be capable of generating approximately 1,183 million kilowatt hours (1183 GWH) of electricity annually. Dickey Dam would be operated principally as a peaking plant, designed to operate at high capacity for short periods of time to meet critical daily peak loads. The power would be melded into the load resource curves of the New England Power Pool system to attain maximum project benefits. In operation, Dickey Dam would release large surges of water through the turbines in relatively short periods of time. Lincoln School Dam, located downstream, would impound and smooth out these releases, reregulating the river. Lincoln School Dam would also generate about 262 GWH of electric power annually.

The flood control potential of the Dickey-Lincoln School Lakes project would also reduce extensive flood damage to Maine and New Brunswick communities.

Planning studies for the project have addressed two levels of development: (1) an authorized installed capacity of 760 MW at Dickey and 70 MW at Lincoln School for a total nameplate capacity of 830 MW; (2) an ultimate development with an additional 380 MW of pumped-storage capacity at Dickey Dam. Further authorization by Congress is required for this additional capacity. The ultimate development would increase the nameplate rating at Dickey to 1,140 MW and the project total to 1,210 MW.

1.02 Study Methodology

This supplemental study, analysis, and report was done using methodology identical to that of the April 1978 EIS. It is a three-phase study: (1) power system planning studies; (2) a review of the corridor identification based on the 1977 VTN Corridor Assessment Study of the entire 32,000 square mile study area; and (3) route identification and impact studies. For consistency, DOE made similar study arrangements with representatives of NEPOOL and of New England region utilities for the additional "Plan of Service" studies. DOE also re-engaged for supplementary route studies the same New England environmental contractors used in the original study. This provided a high degree of continuity and consistency of analysis procedures between studies. The original VTN Corridor Assessment included geographic areas considered as possible locations for the new line to Webster. It contained adequate information to identify corridors and routes for this new study.

1.02.1 Phase 1 - System Planning Studies

The purpose of the system planning study update, fully documented in Appendix A to this Supplement, was to review transmission requirements for Dickey-Lincoln School based on the New England Power Pool (NEPOOL) utilities'

1979 projections of loads, resources, and transmission facilities for New England. The revised energization date for Dickey-Lincoln School is now 1991 for the authorized level of development. Nuclear units in Maine and Vermont, included in the resource data for the earlier transmission system planning studies, are not included in the 1979 NEPOOL resource data.

Preliminary power flow studies were performed by DOE and NEPOOL in May 1979. The latest load and resource data for the region indicated that our previously proposed transmission system, Plan E, would not be adequate for the integration of Dickey-Lincoln School power into the New England electric system with these new assumptions. The New England transmission system anticipated to be "in place" by the time the Dickey-Lincoln School Lakes Project is energized has changed primarily because a nuclear generating plant in western Vermont and two nuclear plants in southeastern Maine have not been built. The Comerford-Webster and Comerford-Beebe plans appear to be better overall for the Dickey-Lincoln project and for New England than Plan E because of their greater flexibility and potential long-term uses. These two plans provide transmission reinforcement toward major load centers from which there is the flexibility of developing 345-kV transmission to the south, east, or west. The most efficient integration of generation from the Dickey-Lincoln School Lakes project into the New England system can be accomplished through the extension from Moore-Comerford to Webster.

(See original DOE draft EIS, especially Appendix C, which discusses the reasons for the selected and alternative plans of service for the overall study, and Appendix B, which discusses all transmission corridors that have been carefully examined, and the reasoning behind the corridor proposal.)

The studies required in the evaluation of the alternative transmission plans have been completed. They were made for 1990-91 winter conditions with heavy load (90 percent of winter peak) and light load (45 percent of winter peak with one Dickey unit pumping); and for 1991 summer conditions with heavy load (90 percent of summer peak) and intermediate load (60 percent of summer peak). Heavy power transfers from north to south with Dickey units generating at full output occur with the summer intermediate load.

Study results demonstrated that the Comerford-Webster transmission plan would adequately integrate the Dickey-Lincoln School project into the New England system. (For more detail, see Appendix A to this Supplement.)

1.02.2 Phase II - Corridor Assessment and Plan of Service Proposal

Given the information from the transmission system planning study, DOE reviewed the Alternative Power Transmission Corridor study (Appendix B to the original draft transmission EIS) and determined that corridors had been defined for the new additional facilities required in the new plan of service. That information served as a basis for detailed route identification studies.

1.02.3 Phase III - Route Identification and Evaluation

This phase was conducted by DOE location engineers and by several New England-based environmental consultants. This phase identified in more detail route locations within the previously defined corridors and the impact of these alternative routes. The data necessary for this supplemental draft EIS was also gathered.

1.02.3.1 Route Identification Studies

Experienced engineers from DOE performed the Reconnaissance Study (Appendix D to this Supplement). This effort included reviewing the previously established corridors and locating alternative one-half-mile-wide transmission line routes within the corridors.

1.02.3.2 Route Impact Studies

Six studies completed by contract are as follows:

Study	Contractor
Geotechnical Impact	E. C. Jordan Co., Portland, Maine
Socioeconomic Impact	E. C. Jordan Co., Portland, Maine
Land Use	E. C. Jordan Co., Portland, Maine
Ecological Resources	Center for Natural Areas, South Gardiner, Maine
Cultural Resources	Public Archeology Facility, State University of New York, Binghamton, New York
Visual-Recreational Resources	Comitta Frederick Associates, West Chester, Pennsylvania

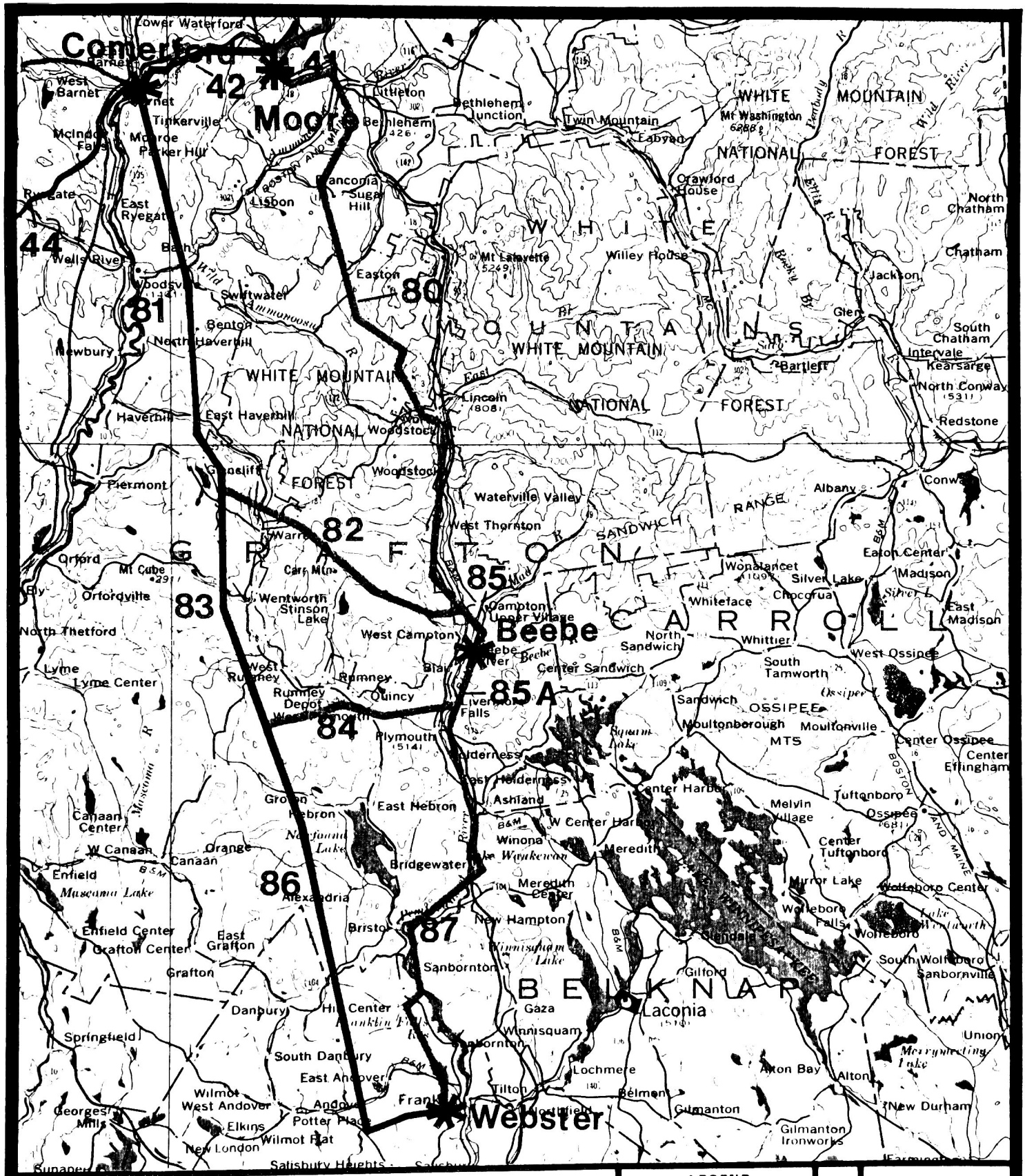
Information resulting from these studies appears in sections of this supplement. Individual study reports are included as appendices to this document.

1.02.3.3 Route Evaluation

Upon completion of reconnaissance and environmental impact studies, DOE held an interdisciplinary evaluation session with the study contractors. In this session, alternative routes were compared with respect to their impacts. Rankings of the alternative routes for each impact assessment topic are included in section 8. The proposed route is considered to have the least overall environmental impact.

1.03 Description of Proposed Facilities

The following facilities would be required for this addition to the proposed plan. Figure 1.03-1 shows their locations.



DICKEY/LINCOLN LAKES TRANSMISSION – E.I.S. PROJECT

FACILITY LOCATIONS

U.S. DEPARTMENT OF ENERGY – BANGOR, MAINE AUGUST 1980

LEGEND

- Proposed Route
- Alternative Route
- Existing Substation
- 86 Link Number

N

SCALE IN MILES

0 2 4 6

FIGURE 1.03-1

1.03.1 Proposed Transmission Lines

At the authorized level of development, the proposed transmission lines would include:

1. A double-circuit 345-kV transmission line on 165-foot steel towers from the Moore Substation to the Comerford Substation near Littleton, New Hampshire. This line would follow the route proposed in the original draft transmission EIS for a single-circuit 345-kV wood pole H-frame line.

2. A 345-kV wood pole H-frame transmission line from the Comerford Substation to the Webster Substation located near Franklin, New Hampshire. The proposed route for the new 345-kV line uses links 41F, 42F, 81, 83, and 86 as shown on Figure 1.03-1. The new line would be constructed within an existing transmission line right-of-way, except for the last 4.5 miles, where it would be parallel and adjacent to an existing transmission line.

The addition of this plan and this line will satisfactorily integrate the Dickey-Lincoln School generation into the New England system. The line construction on the proposed route is slightly more costly than a second-best alternative.

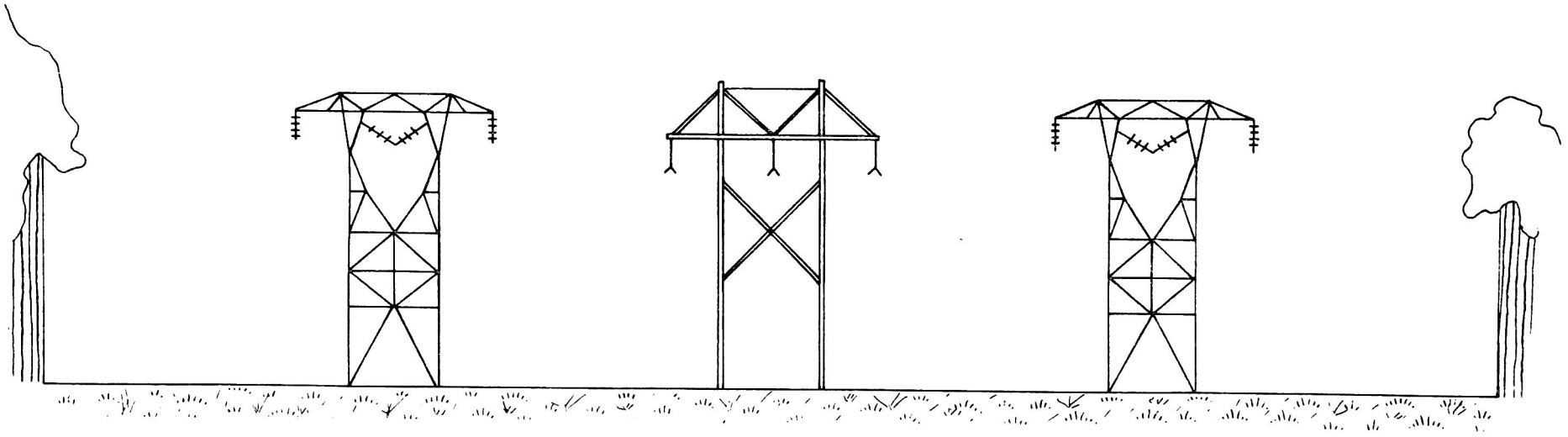
The existing right-of-way proposed for use is owned by the New England Power Company (NEP), Westborough, Massachusetts. Ultimate development of the right-of-way must be compatible with NEP's future needs. NEP does not now have a definite schedule for future additions on this right-of-way.

It is not yet known whether the Dickey-Lincoln School project will be constructed. Therefore, it would not yet be appropriate to negotiate an agreement for the line construction in this location.

NEP's representatives have not objected to including this right-of-way as an alternate in the route studies. If the Dickey-Lincoln School project is funded for construction, options to use this right-of-way for the Dickey-Lincoln School transmission requirements will be explored with NEP representatives. These options will have to be approved by NEP and must be compatible with their long-range needs. The cost of these options must also be compatible with those needs. The cost of these options would be supported by the Dickey-Lincoln School project. In the meantime, it is understood that NEP may need to develop definite plans for use of this right-of-way for their own transmission requirements.

Figure 1.03-2 shows how the proposed transmission line would be located on the existing right-of-way between NEP's steel towers.

At a point 4.5 miles west of the Webster Substation, the proposed line will leave the existing cleared right-of-way and parallel an existing 115-kV line into the Webster Substation.



SKETCH OF EXISTING STRUCTURES AND PROPOSED FACILITY WITHIN CLEARED RIGHT-OF-WAY.

FIGURE 1.03-2

1.03.2 Proposed Transmission Route

The proposed transmission line route was selected from various route alternatives referred to as the route network (see Figure 1.03-1). Individual route elements within the network are termed links. Each link was given a distinguishing number. The proposed transmission line route follows that combination of links considered to have least overall environmental impact. For the purpose of analysis and discussion, the term segment refers to all the alternative routes between two substations. In the original draft transmission EIS, five (5) segments were analyzed and discussed (A through E). This supplement addresses Segment F from the Moore Substation to the Webster Substation.

The proposed route, illustrated in Figure 1.03-1, consists of the following links:

Segment F Moore-Webster: 41F, 42F, 81, 83, 86
Length: 73.8 miles

1.03.3 Design Criteria

Design criteria for both the double-circuit steel structures and the 345-kV wood pole system have been thoroughly discussed in the original draft transmission EIS (Section 1.3.3). That information will also apply to this facility.

Figures 1.03-3 and 4 are diagrams of the steel and wood pole towers, respectively, that would be used in the proposal.

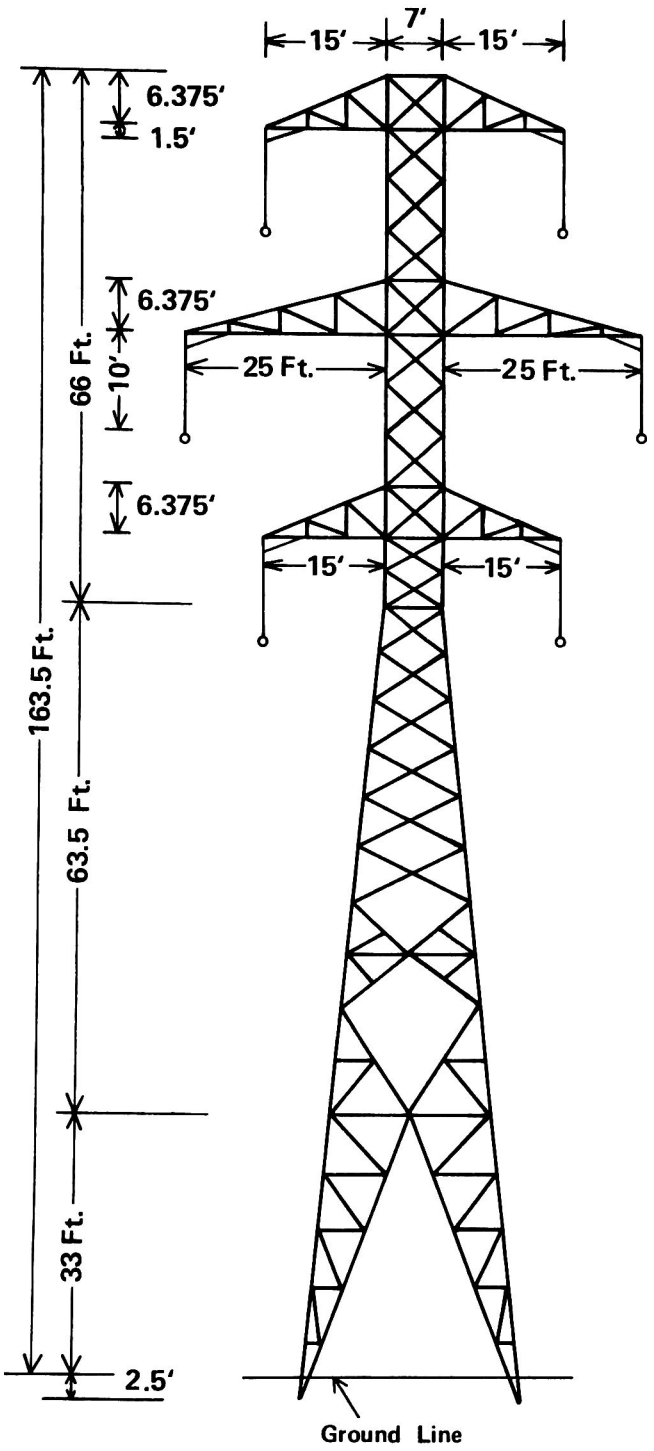
Between the Moore and Comerford substations, the double-circuit line will require an additional 100 feet of right-of-way parallel and adjacent to the existing lines, as in the original studies. From Comerford south, the line would use the existing, cleared NEP right-of-way. A new 100-foot wide right-of-way will be needed from the point west of Webster where the proposed line will leave the already developed right-of-way and proceed to Webster Substation.

1.03.4 Construction Sequence

The original draft transmission EIS (section 1.03.4) discusses the construction sequence for building a transmission line. Where the right-of-way is already cleared, certain steps such as access road construction and right-of-way clearing will not be required.

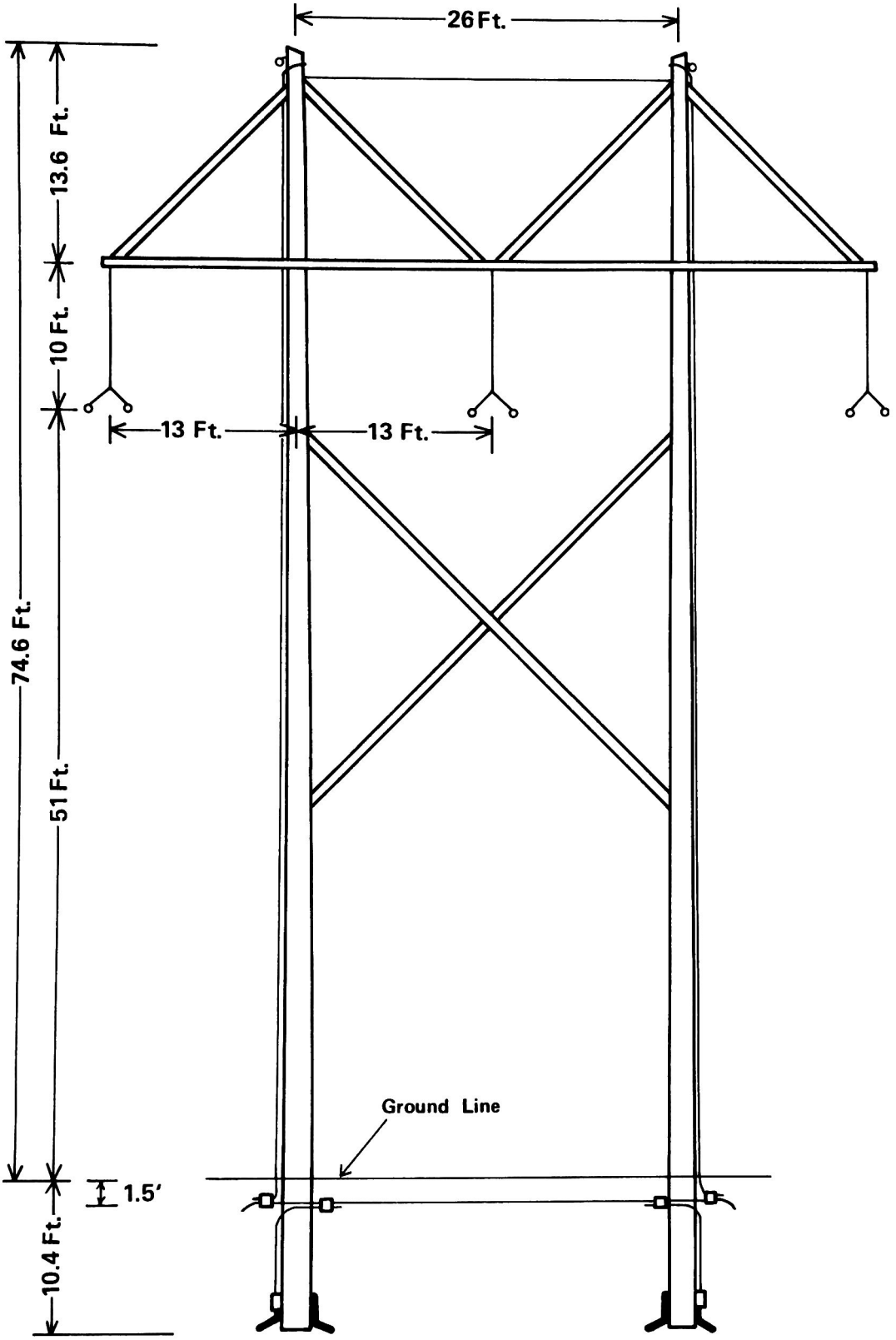
1.03.5 Maintenance

Typical DOE maintenance and vegetation control measures are discussed in the original draft transmission EIS (Section 1.3.5). Identical measures would be used for the proposed line where DOE exercised total responsbility. However, arrangements for joint maintenance on the north-south section of the line, between Comerford and a point west of Webster, would be negotiated with the



345 KV DOUBLE CIRCUIT TRANSMISSION TOWER

FIGURE 1.03-3



345 KV SINGLE CIRCUIT TRANSMISSION STRUCTURE

FIGURE 1.03-4

New England Power Company at the proper time. These would typically consist of selective ground and aerial spraying and minimum development and maintenance of access roads.

1.04 Construction Schedule

The proposed transmission facilities would have to be ready for energization when the first generating units in the power houses at the dams are ready for testing. Construction tentatively would begin five (5) years before generation is scheduled to begin. If the Dickey-Lincoln School Lakes Project is to begin producing power in 1991, the construction of the transmission facilities would begin in the spring of 1985.

1.05 Cost Estimates

Table 1.05-1 shows the total estimated cost for transmission lines and facilities associated with the Dickey-Lincoln School Lakes Project at the authorized level (based on the original draft transmission EIS). The line between Granite and Essex substations is excluded from these estimates, as it is no longer needed.

The estimates include investment costs with interest during construction (IDC). The cost estimates are current as of November 1979. Costs for the Dickey-Lincoln School Lakes Project are discussed in Section 1.10 of the Corps' final EIS.

TABLE 1.05-1. - COST ESTIMATES - TRANSMISSION FACILITIES - ALL SEGMENTS (FORT KENT, ME TO WEBSTER, NH) (7 1/8 Percent Interest Rate)

	Investment ($000)		
	Materials and Construction	Interest During Construction	Total
Transmission Lines	$135,800	$22,910	$158,710
Substations	30,500	4,170	34,670
Power System Control	2,500	340	2,840
TOTALS	168,800	27,420	196,220

COST ESTIMATES - TRANSMISSION FACILITIES FOR MOORE-WEBSTER (SEGMENT F) (7 1/8 Percent Interest Rate)

	Investment ($000)		
	Materials and Construction	Interest During Construction	Total
Transmission Lines	$14,100	$2,380	$16,480
Substations	1,500	210	1,710
Power System Control	450	60	510
TOTALS	$16,050	$2,650	$18,700

Section 2

Description of the Environment Without the Proposal

2.0 DESCRIPTION OF THE ENVIRONMENT WITHOUT THE PROPOSAL

2.01 Geography

The proposed route between Moore and Webster substations is 73.8 miles long. It lies entirely within New Hampshire and parallels existing transmission lines. More than 90 percent of the proposed route lies primarily within existing cleared rights-of-way. The last 4.5 miles into Webster, which will require additional right-of-way clearing, and the first 6.5 miles out of Moore, which will occupy a new right-of-way adjacent to existing facilities, are the exceptions. (This latter facility is identified and discussed in the draft EIS.)

The proposed route begins at the Moore substation adjacent to the Moore Dam and extends west to the Comerford Substation near the Comerford Dam and Reservoir. The route then turns south-southeast toward the White Mountain National Forest. Between Comerford and the National Forest, the route passes over Gardner Mountain east of Monroe. It continues toward West Bath and across the Ammonoosuc River southwest of Bath. It then passes between Pond Ledge and French Pond and continues east of Center Haverhill. Before entering the National Forest, and its Proclamation Area, the route passes east of East Haverhill and crosses Oliverian Brook. Within the National Forest and the Proclamation area, it traverses the area between Webster Slide Mountain and Mt. Mist, which lie east of the proposed route, and Lake Tarleton and Lake Armington, west of the proposed route.

Before leaving the National Forest and its Proclamation Area, the proposed route passes northeast of Ore Hill, where it crosses the Appalachian Trail, and east of Sentinel Mountain. South of the National Forest the route runs near the Baker River, west of Wentworth and of the Villages of Rumney and Rumney Depot. After crossing Bailey Hill, the route continues south-southeast and passes east of North Groton and west of Hebron and Alexandria. In the seven-mile stretch from Hebron to Alexandria, the proposed route passes west of Newfound Lake, the largest lake near the proposed route. The route then passes South Alexandria and over Murray Hill, before passing west of Highland Lake and over Boston Hill in the town of Andover. At Boston Hill, the proposed route runs south of Webster Lake and east of Franklin.

2.02 Geology

The northern portion of the proposed route crosses the western section of the White Mountain National Forest. The route is located in the Appalachian Highland Province of New Hampshire. Local relief ranges from 400 to nearly 1,400 feet with a maximum elevation of 2,100 feet at Sentinel Mountain. The area is underlain by sedimentary and volcanic Paleozoic rocks, the deeply-eroded core of an ancient mountain system. These metamorphosed rocks have been faulted and folded and intruded by igneous bodies. The general strike of the rock is north-northeast, swinging to northeast, north of latitude 44 degrees. The Bronson Hill Anticline is the dominant structural feature of this general area. The Paleozoic rocks have been intruded by three distinct plutonic series: the White Mountain Plutonic - Volcanic Series; the New Hampshire Plutonic Series; and the Oliverian (dome-forming) Plutonic Series.

A more detailed discussion of geology, soils, and mineral and aggregate deposits is found in the Geotechnical Impact Study, Appendix F to this Supplement.

2.03 Soils

Most of the soils along the proposed route have formed in glacial till. The specific soil characteristics vary according to the area's elevation and topography. In the lower elevations common to the portion of the route from the Connecticut River to the boundaries of the White Mountain National Forest at Easton, Benton, and Warren, the glacial till soils belong to the Berkshire-Peru-Marlow association. They are primarily sandy but range from gravelly to silty and are mostly well-drained and moderately well-drained. Berkshire-Lyman association soils are found on the high ridges and steep slopes of this area. They have characteristics similar to those of the Berkshire-Peru-Marlow association except that they are shallow to bedrock; bedrock exposures are common. Most soils of these two associations have low erodibility.

Among the White Mountains, the glacial till soils are generally sandier, better drained, and less developed than the soils of the northern sections of the proposed route. Along the highest elevations and steeper slopes the soils belong to the Hermon-Canaan association. They are somewhat excessively drained. Bedrock is usually found within two feet of the surface and exposed bedrock is very common. The soil erodibility is low but the steep slopes of the area result in a high erosion potential. Soils of the Herman-Becket-Canaan association are found on the lower slopes and rounded hills in this area. They are generally sandy, well-drained, and of low erodibility.

In the southern section of the proposed route, near Highland and Webster Lakes, the glacial till soils belong to the Payton-Shapleigh-Woodbridge association. They are well to moderately well-drained and commonly have distinct fragipan. Depressional areas are wet and swampy areas are common. Textures range from silty to sandy and soil erodibility is moderate.

Terraces and flood plains are evident along most streams and rivers crossed by the proposed route. Along the upper reaches of these streams the soils are generally sandy to gravelly. They are usually excessively drained and are often mined for gravel. The largest deposits of these soils in the study area are located along the upper reaches of the Baker River. Soil erodibility is low.

2.04 Mineral and Aggregate Deposits

There are no known exploration programs concentrating on the area traversed by the proposed transmission lines. However, mineral exploration effort has been expanded considerably in the Northern Appalachian region in recent years, especially for massive sulfide deposits and uranium. It is reasonable to assume that the escalating price of gold and silver may cause renewed interest in prospects and deposits previously considered uneconomical.

Along the proposed route, a number of copper prospects and/or mines are found to the south of link 42F. Copper and lead prospects are found adjacent to link 81, in addition to quartz, soapstone, an active traprock quarry, and an abandoned limestone quarry. A massive metamorphosed sulfide deposit at Ore Hill, west of link 83, has produced copper, lead, and zinc. From link 83 south, a number of old mica-feldspar-beryl prospects and/or mines are found. Aggregate sources are found along all links of the proposed route.

2.05 Climate and Air Quality

The transmission draft EIS contains a general discussion of climate and air quality in the study region--Maine, New Hampshire, and Vermont. That discussion of general climatic conditions such as temperature, precipitation, winds, storms, and floods pertains to the Moore-Webster Segment of the transmission system. Wind and ice loading are two climatic factors which exert forces upon the transmission towers and conductors. These factors are addressed in the design of the facilities in accordance with the National Electric Safety Code (NESC) of the American National Standard.

2.06 Surface Water

Surface water resources are summarized below. Also see the Ecological Resources Impact Study, Appendix E to this Supplement.

2.06.1 Aquatic Resources Inventory

Aquatic resources were inventoried in the Ecological Resources Impact Study, Appendix E to this Supplement. Aquatic resources are categorized as: streams, wetlands, and lakes. Streams include rivers and brooks. Wetlands are distinguished by the dominant form of vegetation and classed as bogs, marshes, or swamps. Lakes, as defined, include both ponds and lakes.

2.06.2 Inventory of Water Features

Water features inventoried for this study are listed in the Ecological Impact Study, Appendix E to this Supplement. Significant water features are discussed in the following section.

2.06.3 Aquatic Resource Ecological Values

Aquatic habitat values for the proposed route are listed in Table 2.06-1. The values in the table are representative of the following streams, lakes and wetlands. In the northern portion of the proposed route, aquatic resources include: French Pond, a 31-acre lake which supports a warmwater fishery of smallmouth bass, yellow perch, horned pout, and golden shiner; the Ammonoosuc River, a poor-to-fair fishery stocked annually with brook trout, brown trout, and rainbow trout; Childs Brook, a fair trout fishery; Oliverian Brook, stocked annually with brook trout; Clark Brook, stocked with brook trout; and Ore Hill Brook, a poor trout fishery. Highland Lake is a low-to-moderately productive 200-acre pond with a heavily developed shoreline. It supports both coldwater and warmwater fisheries and is stocked with smallmouth bass, brook

trout, and rainbow trout. Webster Lake is a moderately productive 61.2-acre lake which supports a fair warmwater fishery and is not stocked. Excellent trout fisheries are present in Cockermouth River, Smith River, Halls Brook, Hardy Brook, Fowler River, and Patten Brook. All these streams except Hardy Brook are stocked with brook trout. The Smith River is also stocked with rainbow trout, and the Cockermouth River supports a salmon fishery. Wetlands near South Alexandria are considered by the New Hampshire Fish and Game Department to be good-to-excellent habitat for waterfowl.

TABLE 2.06-1. AQUATIC HABITAT VALUES 1/ PROPOSED ROUTE: MOORE-WEBSTER

	Value				
Habitat	1 (Low)	2	3 (Moderate)	4	5 (High)
Streams (No.)	46	9	6	6	5
Lakes (No.)	1	--	--	1	1
Wetlands (No.)	12	5	5	1	--

1/ Reference: Ecological Resources Impact Study, Appendix E to this Supplement.

2.06.4 Water Quality

All lakes, ponds, streams and rivers along the proposed route are Class B, according to the water quality classification system of the State of New Hampshire. The classification does not necessarily represent existing water quality. Rather, it reflects goals for water quality in the classified body of water. The recommended-use classification is:

> Class B: Acceptable for bathing and recreation, fish habitat, and public water supply after adequate treatment; no disposal of sewage or wastes unless adequately treated.

2.06.5 Floodplains and Wetlands

Information on 100-year floodplains was obtained from Flood Hazard Boundary Maps prepared by the Department of Housing and Urban Development along with Flood Insurance Rate Maps for the City of Franklin. This information indicates that the proposed route crosses about 14 floodplain areas. The longest floodplain area crossed is approximately 1,200 feet; the total length of floodplain crossed is 6,450 feet. Table 2.06-2 indicates the location of the floodplains by link and mile number. The proposed facility will also cross 13 wetland areas.

TABLE 2.06-2. - LOCATION OF FLOODPLAIN AREAS CROSSED BY PROPOSED ROUTE

Link	Mile
42	2
81	8, 11, 16, 16, 17, 20
83	7, 9, 11
86	7, 17, 25, 30

2.07 Vegetative Communities

2.07.1 Plant Communities

The following cover types were inventoried within one-quarter mile of the proposed route.

Community Types	Designation	Community Types	Designation
Spruce-Fir Mature	SWM	Regenerating (RGN)	SWR, MR, PBR, HWR
Pine Hemlock Mature	PNW or PHM	Regenerating Abandoned Cultivated Field	RAF
Pine-Hemlock Regenerating Cedar	PNR CS	Row Crops Wetlands	F BG, M, SP, OW
Softwood-Hardwood Mature	SHM	Open Water	OW
Hardwood-Softwood Mature	HSM	Existing Right-of-way	ERW
Poplar-Birch Mature	PBM	Man-Made	MM
N. Hardwoods Mature	HWM		

Cover Types:

SWM: Spruce-fir mature
PNM: Pine-hemlock mature
PNR: Pine regenerating
CS: Cedar swamp
SHM: Mixed mature with softwoods predominating
HSM: Mixed mature with hardwoods predominating
PBM: Poplar-birch mature
HWM: Hardwood mature
RGN: Forest regeneration
RAF: Regenerating agricultural fields
F: Row crop fields
AF: Other fields
W: Wetlands (excluding open water and unvegetated shoreline)
OW: Open Water (including unvegetated shoreline)
MM: Man-made Features (buildings, gravel pits, garbage dumps, etc.)

The total acreage within the route and the lineal mileage of each community type is listed in the Ecological Resources Impact Study (Appendix E to this Supplement).

Mature softwood forests and mixed mature softwood forests are the predominant vegetative cover types along links 41F, 42F and 81 in the northern portion of the proposed route. Mature hardwoods are a secondary cover type. In addition, there are some row crops. Mature hardwood forests consisting of eleven (11) different cover types predominate along links 83 and 86, in the central and southern portions of the proposed route.

2.07.2 Rare, Threatened or Endangered Plant Species

The potential for encountering rare, threatened, or endangered plant species was evaluated, using two procedures. The first recognizes that certain conditions of soils, slope, orientation, and exposure make the occurrence of a rare plant species or an assemblage of many uncommon species much more probable. The second was an inventory, along the proposed route, of numerous ledges potentially valuable to rare plants. Eleven miles of ledge habitats with rare plant potential are crossed by the proposed route right-of-way. (See pp. 3-25 and 3-26, Appendix E to DOE 1978 EIS for list of potential rare plants native to cliffs.)

2.08 Wildlife

A general discussion of wildlife resources along the proposed route is presented below. Also see the Ecological Resources Impact Study, Appendix E to this Supplement.

2.08.1 Wildlife Values

The value of habitats encountered is described below for the proposed route. Values ranging from high to low reflect the relative value of these habitats for "species of special concern," for "harvested species," and for "all

species." Total miles of the proposed route crossing various species habitats are listed in Table 2.08-1, by habitat value. Habitat values for "species of special concern" and "all species" are very high along link 41F, and average for "harvested species" (game). Link 42F values are average for all three species categories; however, deer are present in very high numbers throughout the northern portion of the proposed route and bear are present in moderate numbers. Habitat values along the remaining links of the proposed route are below average for "species of special concern" and "all species," and average for "game species." Bear harvests are relatively high in the towns of Haverhill, Warren, and Monroe along link 81; in Wentworth and Warren along Link 83; and in Groton and Hebron along link 86. Numbers of deer are high along link 81, an area noted for some of the better hunting within the White Mountain National Forest. There is a reintroduction site for the peregrine falcon near link 81, but outside the route. However, the centerline of link 81 intersects some wetlands currently being considered by the U.S. Fish and Wildlife Service as potential "critical habitat" for the peregrine falcon. Five vulnerable habitat fragments occur along the link 83 right-of-way, and six fragments occur adjacent to the link 86 right-of-way. In the southern portion of the proposed route, deer harvests are low in the towns of Alexandria, Groton, and Hill; they are moderate in the towns of Andover and Hebron.

TABLE 2.08.1 - TERRESTRIAL HABITAT RATINGS 1/ PROPOSED ROUTE: MOORE-WEBSTER

	Value				
	1 (Low)	2	3 (Moderate)	4	5 (High)
Habitat					
Species of Special Concern: (Miles)	14.3	37.2	19.0	3.0	0.3
(Percent)	19	50	26	4	1
Harvested (Game) Species:					
(Miles)	3.0	17.5	46.3	5.0	2.0
(Percent)	4	24	62	7	3
All Species: (Miles)	3.0	37.5	32.0	5.3	1.0
(Percent)	4	44	43	7	2

2.08.2 Rare, Threatened or Endangered Wildlife Species

The peregrine falcon, a threatened species, is discussed above. A possible nesting site of the Coopers hawk, a "species of special concern," was also noted within the southern part of link 81.

2.09 Socioeconomics

For purposes of analysis, the municipality or town, rather than the half-mile-wide route, was studied. Two regional groupings (region VI and VII) were developed in the original draft EIS to reflect municipalities with similar

socioeconomic characteristics; and three subregions were designated within these to acknowledge more unique characteristics of specific towns or groups of towns. These divisions are used here. (Table 2.09-1 and Figure 2.09-1: Socioeconomic Political Structure/Regional Divisions.)

TABLE 2.09-1. - TOWNS AND SOCIOECONOMIC SUBREGIONS CROSSED BY PROPOSED ROUTE: MOORE-WEBSTER

Socioeconomic Subregions			
VI-A	VI-B	VI-C	VII
Monroe	Benton	Groton	Hill
Littleton	Warren	Hebron	Andover
Bath	Wentworth	Alexandria	Franklin
Haverhill	Rumney		
Lyman			

Region VI, North Central New Hampshire, is dominated by the White Mountains. The area is composed of small, rural communities with Littleton (population 5,200) and Plymouth (population 4,400) forming the two largest towns. The region is characterized by extensive forest cover, the White Mountain National Forest, cultivated areas above the Connecticut River, and a limited economic base dominated by seasonal tourism. It is subdivided into three subregions centered around Littleton, North Woodstock, and Plymouth.

Region VII consists of three communities in the Central Lakes Region, an area which grew significantly in the late sixties and early seventies. Franklin is a densely populated manufacturing community, while the two outlying communities, Hill and Andover, are rural, forested, and characteristically changing to bedroom communities as greater job opportunities occur in Franklin and Laconia.

Existing Socioeconomic conditions are summarized in Table 2.09-2. Also see the Socioeconomic Impact Study, Appendix H to this Supplement.

2.10 Existing Land Use

Land uses were identified in a half-mile-wide corridor along 73.8 miles of the proposed route. The proposed route is different from other segments of the Dickey-Lincoln School system because it is much more developed. Nevertheless, the area would be considered quite rural as compared to most of the northeast. It is frequently used as a vacation area and outdoor recreation resource.

Of over 260 residences inventoried within a one-half-mile-wide route, approximately 23 are seasonal residences. Other significant land uses within this route include 1,640 acres of agricultural land, 123 acres of mining, and over 16,000 acres of forest land. Recreational uses are highlighted by the White Mountain National Forest. Campgrounds and municipal and state parks encompass a significant area. Also see the Visual-Recreation Resources Impact Study, Appendix I to this Supplement.

TABLE 2.09.2. - SOCIAL AND ECONOMIC BASE DATA FOR REGIONS VI AND VII

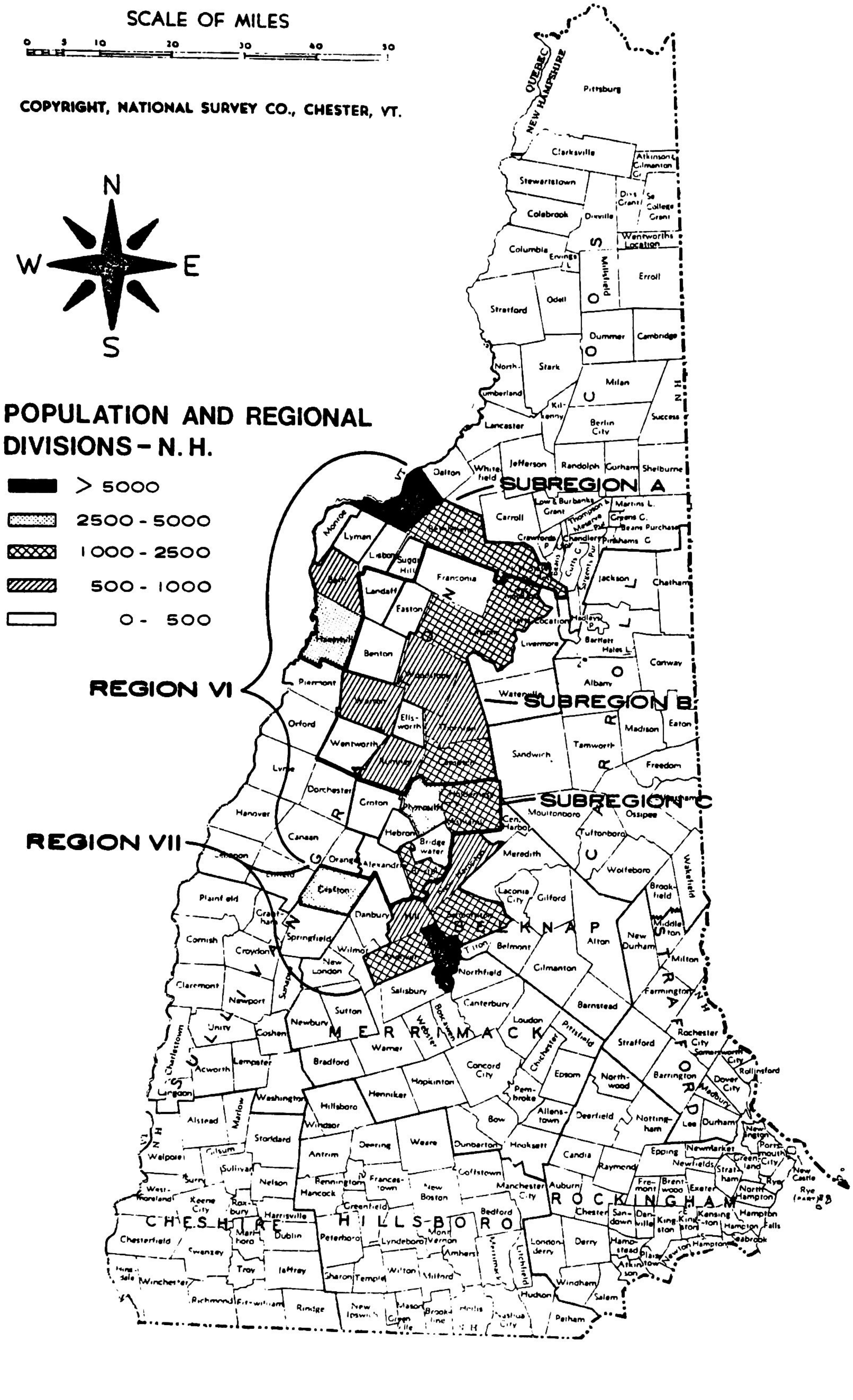
Subregion	Population Density People Square Mile	Commercial Center 1/	Population of Commercial Center	Past Growth Rate	Projected Growth Rate	Temporary Housing Supply 2/	Emphasis on Local Planning 3/	Access to Population Centers 4/
VI-A	38.4	Littleton	5,000	Fluctuating	Stable	Numerous	Moderate	Moderate
VI-B	12.0	Plymouth	4,300	Moderate	Moderate	Numerous	High	Moderate
VI-C	26.7	Plymouth	4,300	Moderate	Moderate	Numerous	High	Moderate
VII	76.8	Franklin	7,500	Moderate	Stable	Numerous	Moderate	Moderate Tourism

Subregion	Labor Force 5/	Economic Growth 6/	Median Family Income 7/	Tax Base 8/	Land Ownership Pattern
VI-A	9,502	Slow	$8,080	Residential Yield	Residential Agriculture
VI-B	5,000	Slow	9,066	Residential	Government, Residential
VI-C	5,000	Slow	9,765	Residential Industrial	Residential, Commercial
VII	10,000	Moderate	9,526	Residential Industrial	Residential, Commercial

Subregion	Labor Force 5/	Economic Growth 6/	Median Family Income 7/	Tax Base 8/	Land Ownership Pattern
VI-A	9,502	Slow	$8,080	Residential Yield	Residential Agriculture
VI-B	5,000	Slow	9,066	Residential	Government, Residential
VI-C	5,000	Slow	9,765	Residential Industrial	Residential Commercial
VII	10,000	Moderate	9,526	Residential Industrial	Residential Commercial

LEGEND: Sources are indicated in text. Unless otherwise noted, rankings reflect regional rates.

1/ The principal commercial center serving the subregion.
2/ Based on probable demand placed on the area by the construction process labor force. "Numerous" means enough facilities for the workers to choose from.
3/ Based on: 1) existence of town plans and/or zoning ordinances; and 2) effectiveness in using plans.
4/ Based on distance to population centers, the size of the center, extent of services available.
5/ Where local labor force figures are unavailable, state labor participation rates were used.
6/ Based on state averages "slow" indicates growth lower than state average; "moderate," similar to state average; "high," greater than state average.
7/ Based on 1970 county data. Excludes Littleton, for which the figure is $8,620.
8/ Indicates the principal source of local tax revenues (based on ad valorem property tax).



Dickey/Lincoln School Lakes Transmission - E.I.S. Project

Environmental Assessment of Alternative Routes

FIGURE 2.09-1

2.11 Proposed Land Use

Land use planning within the study area is conducted at three levels: state, regional, and local. The New Hampshire Office of State Planning reviews all projects that could affect State resources and acts as coordinator for regional and local planning commissions. Planning regions active within the Segment F study area include the North Country Council Inc. and the Lakes Region Planning Commission. Most towns have active planning commissions and have developed municipal plans and enacted zoning ordinances.

2.12 Recreation

Recreational resources are identified in Visual-Recreation Resources Study, Appendix I to this Supplement, and are mapped in Appendix K, the Map Volume. Recreational resources are numerous throughout Segment F and near the proposed route. The area is a popular tourist attraction during the summer months, offers spectacular fall foliage viewing, and has excellent facilities and winter conditions for downhill and cross-country skiing. The White Mountain National Forest is the dominant recreational feature, bordered on the north by recreational resources close to and associated with the Moore and Comerford Reservoirs and on the south by resources in the Newfound Lake-Cardigan Mountain areas.

The proposed route enters the White Mountain National Forest and its Proclamation Area just south of East Haverhill and remains within the Forest Proclamation boundary for approximately 9 miles. The Appalachian Trail (AT) and the proposed AT relocation is crossed by the route in this area. Other hiking trails, part of a larger network associated with Cardigan Mountain, are crossed in the vicinity of Newfound Lake. "Recreational" highways (classified as bicycle, sightseeing, fall-foliage, and/or scenic routes) along the proposed route include Routes 135 and 302 in the northern portion, Routes 25 and 25A in the National Forest area, and Routes 104 and 11 in the southern portion of the proposed route.

Recreational water bodies along the route inlcude rivers and lakes, in addition to Moore and Comerford Reservoirs. Significant rivers include the Ammonoosuc River, the Baker River, the South Branch of the Baker River, and the Smith River. All these rivers are popular canoeing streams and have been designated potential State Recreational Rivers. The Ammonoosuc River is designated a potential State Scenic River. Important lakes include Newfound Lake (site of Wellington Beach State Park), Highland Lake, and Webster Lake. All these lakes are popular swimming, boating, and fishing areas. Their shores have been extensively developed with seasonal residences.

The only ski area along the proposed route is at Flag Pole Hill, south of Franklin. In addition, cross-country skiing is popular throughout the area, particularly along the numerous hiking trails.

2.13 Visual

Visual resources are summarized below. Also see the Visual-Recreation Resources Impact Study, Appendix I to this Supplement.

2.13.1 Visual Landscape Quality

Visual landscape quality describes qualitatively the view, before construction, afforded a viewer looking toward the proposed location of the transmission facility from any point within the viewshed. Impacts on visual landscape quality reflect changes to this condition.

In general, visual landscape quality within this area decreases as one moves from north to south. The proximity of the northern links to the White Mountains and Connecticut River Valley produces high visual quality. Only along part of Link 81, however, is landscape quality rated "exceptional." River townscapes and the townscapes of Bath and East Haverhill enhance the views along Link 81. Throughout the northern half of the proposed route, topographic interest is primarily high; white-water and wetland interest is low to moderate. Areas of high water/wetland interest are found in the vicinity of the Moore and Comerford Reservoirs, and near Lake Tarleton.

Further south, the amount of development tends to increase. The proposed route is located in hills adjacent to mountains, and topographic interest declines accordingly. However, the role of townscape views in enhancing visual quality increases, particularly in the vicinity of Alexandria, South Alexandria, Willow School, and East Andover. Water and wetland interest is primarily low to moderate here, but high in the vicinity of Webster and Highland Lakes.

Visual landscape quality is summarized in Table 2.13-1.

2.13.2 Visual Site Attractiveness

The term "visual site attractiveness" is used to express the qualities of a "near" view that one might see along the route. Views were rated for quality as very high, high, moderate, low or none. Very high site attractiveness usually occurs near surface water bodies or historic sites. Wooded areas generally have moderate site attractiveness. Where the proposed transmission facilities would be located within existing rights-of-way, a rating of "none" was usually assigned.

Visual site attractiveness along the proposed route is summarized in Table 2.13-2. Since 69.3 miles of the proposed route lies within existing rights-of-way, 94 percent of the study area is characterized as having no site attractiveness. That portion of Link 86 from Boston Hill to Webster Substation requiring right-of-way expansion has predominantly moderate site attractiveness. However, site attractiveness is rated very high within mile 30 where the proposed route crosses Chance Pond Brook.

2.13.3 Visually Sensitive Land Uses

Since site attractiveness and landscape quality are described for the proposed route corridor, the visually sensitive land use discussion involves the entire viewshed. Visually sensitive land uses are listed in Table 2.13-3.

The visually sensitive land uses within the viewshed of Segment F are located primarily within the river valleys crossed or paralleled by the links. Nearly all of the major communities and heavily travelled highways in the viewsheds are in these river valleys. In addition to the rivers, several large water bodies with significant shoreline development exist within the viewshed. The Connecticut and Ammonoosuc River Valleys dominate the viewsheds north of the White Mountain National Forest. Town centers within this area include: Monroe, Woodsville, Bath, and Swiftwater in New Hampshire; and Newbury, Wells River, East Ryegate, McIndoe Falls, and Barnet in Vermont. U.S. Route 302 and N.H. Route 10 are significant highways along the Ammonoosuc River Valley with an average daily traffic (ADT) greater than 3000. The Moore and Comerford Reservoirs are important water bodies at the northern end of the viewshed. South of here, the Connecticut River Valley is paralleled by Interstate 91 and U.S. 5 in Vermont (both roads with ADT's of 3000 or more). Historic sites include many widely dispersed historic homes and covered bridges at Bath, Swiftwater, and Woodsville.

The Baker River Valley dominates the proposed route viewshed adjacent to the western extension of the White Mountain National Forest. Within the river valley are N.H. Route 25 and 118, with average daily traffic (ADT) between 700 and 3,000, and the town centers of Warren, Wentworth, Rumney, and Rumney Depot. Water bodies in the area include Lakes Tarleton and Armington, and the Baker Ponds. There are numerous historic sites in the area, particularly within the villages of Rumney and Rumney Depot.

TABLE 2.13-1. - VISUAL LANDSCAPE QUALITY SUMMARY 1/
PROPOSED ROUTE: MOORE-WEBSTER

Ratings	Miles Crossed	Percent
Very Low	---	---
Low	3.9	5.3
Moderate	8.0	10.8
High	34.4	46.6
Very High	21.7	29.4
Exceptional	5.8	7.9

1/ Reference: Visual Recreation Resources Impact Study, Appendix I to this Supplement

TABLE 2.13-2. - VISUAL SITE ATTRACTIVENESS SUMMARY 1/
PROPOSED ROUTE: MOORE-WEBSTER

Ratings	Miles Crossed	Percent
None	69.3	93.9
Low	0.1	0.1
Moderate	3.8	5.2
High	0.5	0.7
Very High	0.1	0.1

1/ Reference: Visual Recreation Resources Impact Study, Appendix I to this Supplement.

TABLE 2.13-3. - VISUALLY SENSITIVE LAND USES 1/
PROPOSED ROUTE: MOORE-WEBSTER

Viewshed Size	Links 41F	42F	81	83	86
Acres:	13,650	37,990	131,580	73,300	161,300
Square Miles:	21.3	59.4	205.5	116.1	252.0
Residences (Clusters)					
1-5 Units:	64	184	650	347	852
6-25 Units:	2	2	25	9	37
25+ Units:	---	1	14	7	26
Roads					
0-750 ADT 2/					
Miles:	20.0	58.0	166.8	78.5	227
Number of Crossings:	4	4	14	7	19
750-3000 ADT					
Miles:	4.2	5.7	4.4	15.5	34.2
Number of Crossings:	1	---	---	1	1
3000 + ADT					
Miles:	---	5.0	41.3	---	15.1
Number of Crossings:	---	---	1	---	---
Passenger Railroads					
Miles:	---	---	---	---	---
Number of Crossings:	---	---	---	---	---
Historic Sites:	3	9	39	22	129
Transmission Lines Paralled					
Miles:	0.3	6.2	24.9	12.3	30.1

1/ Reference: Visual-Recreation Resources Impact Study, Appendix I to this Supplement.

2/ Average Daily Traffic Volume

Visually sensitive land uses within the viewsheds south of the National Forest are dominated by development associated with Newfound Lake. Towns in the vicinity of the lake within the viewshed include Hebron and Alexandria. New Hampshire Routes 3A and 104 are significant highways serving the Newfound Lake area (ADT 750-3,000). Major areas of visually sensitive land uses south of this area are clustered around Highland and Webster Lakes.

2.14 Forest Resources

A summary of forest resources is presented below. Also see the Socioeconomic Impact Study, Appendix H to this Supplement, for more details.

Amounts of forest land were measured in acres according to linear distances of forest types along the proposed route. The only area affected along the proposed route is 4.5 miles of Link 86 from Boston Hill to Webster Substation. Here, a 100-foot expansion of the existing right-of-way would be necessary. Of the 45.8 acres of required forest cover removal, approximately 0.2 acres are mature pine-hemlock stands, 23.6 acres are mixed mature softwood-hardwood stands, and 22.0 acres are mature northern hardwood stands.

Significant sawlog timber types harvested in New Hampshire's forest include hemlock, white pine, spruce fir, yellow birch, hard maple, and oaks. Pulp-woods include spruce fir, white ash, beech, and soft maple. Paper birch, yellow birch, and the oaks are also sources of veneer grade lumber.

Economic losses to New Hampshire caused by the removal of commercial forest land for a transmission corridor would consist primarily of reduction in property tax revenues and in losses of income generated by the logging and processing of timber. Wood product values (1978 stumpage prices) range from $2-$3 per cord for hardwood pulpwood and $2-$10 per cord for hardwood fuelwood to $15-$25 per cord for yellow birch boltwood and $20-$30 per cord for white birch boltwood. For sawlogs, 1978 stumpage price per MBF ranges from $10-$25 for beech and $15-$30 for hemlock to $40-$90 for red oak and $40-$95 for yellow birch. Yellow birch veneer logs averaged $100-$150 per MBF. To predict the total economic impact of each cord of wood lumbered, the value added during manufacturing was estimated at $730 per cord.

In New Hampshire, taxation of forest land is based on current use assessment. Under the State's yield tax law, timber is taxed when harvested at a rate of 10 percent of stumpage value.

2.15 Cultural Resources

A detailed discussion of cultural resources is presented in the Historical-Archeological Impact Study, Appendix J to this Supplement. A summary is presented below.

2.15.1 Historic Resources

The villages of Rumney Depot and Rumney are of sufficient content and integrity to warrant planning consideration to protect their resources. Areas of potentially significant structures lie in the eastern outskirts of Monroe,

North Groton, and Alexandria. Outside of these areas are numerous historic houses, covered bridges, and cemeteries scattered within the viewshed of the proposed route.

2.15.2 Archeological Resources

Field surveys revealed no previously undiscovered archeological sites within one-quarter mile of the proposed transmission facilities. Known archeological sites, for the most part, are poorly reported and lack substantiating data. Any new sites discovered could shed light on the total picture of prehistoric activity in the area.

A state-registered prehistoric site is in the viewshed of link 83; and a possible historic foundation lies directly in the center of the Link 83 right-of-way. Link 86 crosses the Mascoma Trail, an Indian trail with potential for archeological material.

Section 3

The Environmental Impacts of the Proposed Action

3.0 THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

3.01 Ecological Interrelationships

General ecological interrelationships are discussed in the initial transmission draft EIS on pages 3-1 to 3-3.

3.02 Geology

Construction of the proposed transmission facilities will have little impact on the geologic structure of the region. Some features, such as unstable landslide areas, could potentially damage transmission facilities and affect their reliability. Careful siting and special designs can minimize these hazards. The proposed facilities may be subjected to seismic activity. However, earthquakes of low or medium intensity would have little or no effect on the facilities. The transmission lines, the right-of-way clearings, and the access roads are not influenced by the frequency or intensity of earthquakes. Also see the Geotechnical Impact Study, Appendix F to this Supplement.

3.03 Soils and Topography

The potential for erosion along the proposed route has been evaluated in terms of erodibility of the soil and the degree of the slope. Three and eight-tenths miles (5 percent) of the proposed route were assigned high impact; 38 miles (51 percent) moderate; 32.5 miles (44 percent), slight impact. If during construction an area is stripped and the soil left bare, erosion will undoubtedly occur, especially on alluvial and lacustrian soils. Even soils rated as having only a slight erosion potential will erode if disturbed and left exposed for long periods of time. Thus, construction practices will largely determine how much erosion will actually occur. The erosion potential classification serves as an indication of a soil's rate of erosion with respect to its slope.

Slope stability was evaluated based on slope data and soil descriptions. Generally, only steep and excessively steep slopes will have stability problems. The most severe problems will occur where the degree of slope exceeds 50 percent. Slopes of less than 15 percent should be stable for all soil types evaluated.

The northern-most links of the proposed route would be little affected by the proposed construction, due to the low-to-moderate slope conditions. Link 83 would be moderately affected. Increased sedimentation potential in the southern portion of the proposed route would result in moderately high impacts.

3.04 Mineral and Aggregate Resources

There will be no direct impacts upon areas of present mineral or aggregate extraction. Mining of potential deposits can normally take place beneath existing lines. In other cases, the cost of moving the line is inexpensive relative to the value of the underlying resources.

Certain geophysical exploration techniques are negatively affected by power transmission lines, e.g., electromagnetic survey, resistivity surveys, etc. On the other hand, the building of power lines and access roads might expose more bedrock, thus allowing better evaluation of the area.

3.05 Atmosphere

The initial transmission EIS study adequately covers climatological, air quality, and noise impacts. Since the proposed route will occupy an existing cleared right-of-way for more than 90 percent of its length, microclimatic changes from vegetation removal will not be an issue over most of the proposed route. The 4.5 miles of right-of-way which will be cleared for the proposed route will parallel an existing right-of-way, thereby causing less potential microclimatic impact than if a totally new right-of-way were developed.

3.06 Aquatic Ecosystems

The number and level of aquatic ecosystem impacts on the region's streams, lakes, and wetlands are listed in Table 3.06-1. A total of 51 streams and 13 wetlands could be affected. Thirty-three streams are crossed obliquely, 9 are crossed perpendicularly, and 9 are parallelled. Seven wetlands are crossed directly, and 6 are downslope from the proposed route. In the northern portion of the proposed route, along link 42F, low-to-moderate impacts may occur on the streams crossed. Along link 81, potential impacts of sedimentation and herbicide runoff on streams is relatively moderate, as are potential impacts on wetlands. Of special concern along this link is French Pond, an important waterfowl area adjacent to the right-of-way. The Baker River is also of special concern, as it is an important salmon fishery. Potential impacts of sedimentation and herbicide runoff on streams is moderate along link 83 and high along link 86. There are several excellent trout streams of special concern crossed by link 86. The most significant impact will occur to streams at link 81 (miles 3, 11 and 16); link 83 (mile 9); and link 86 (miles 4, 7, 14, 17, 18, 21, and 24). Of particular value are Upper Baker River and Childs, Smith, Fowler, Halls, Pattern, and Hardey Brooks. Wetlands impacts along the proposed route are slight along link 83 and moderate along link 86.

TABLE 3.06-1. - AQUATIC ECOSYSTEM IMPACT - SUMMARY 1/
PROPOSED ROUTE: MOORE-WEBSTER

Impact Levels		Streams		Lakes		Wetlands	
		Number Impacted	Percent	Number Impacted	Percent	Number Impacted	Percent
Slight	1	29	39	1	33	7	31
Low	2	25	34	---	---	4	17
Moderate	3	7	10	1	33	9	39
High	4	5	7	---	---	1	4
Severe	5	7	10	1	33	2	9

1/ Reference: Ecological Resources Impact Study, Appendix E to this Supplement

An analysis of the 100-year floodplains and of the 13 wetlands that would be crossed was made in accordance with the provision of the Floodplain/Wetland Environmental Review requirements (Executive Orders 11988 and 11990 respectively). There will be no impacts as a result of crossing these floodplain areas in terms of increased hazards of flooding.

Overall impacts to the 13 wetlands directly crossed and to those either down-or up-slope from the facility are indicated in Table 3.06-1. The values shown on this table reflect the overall impact to the aquatic resources including sedimentation, herbicide runoff, and fisheries/wildlife impacts. Impacts associated with increased flood hazard will be minimal to non-existent on those wetlands crossed by the facility.

Because the proposed facility either parallels or shares existing right-of-way it is not possible to avoid floodplain and wetland areas. To avoid these areas would substantially increase impact on many other resource areas and values. Section 8, "Alternatives to the Proposed Action," contains detailed discussion and explanation of the impacts on all alternatives studied and demonstrates that any change from the proposed route will increase resource impacts. No practicable alternative to avoid these floodplains exists.

The Ecological Resources Impact Study, Appendix E to this Supplement treats Aquatic Ecosystem, Vegetation, and Wildlife impact in greater detail.

3.07 Vegetation

The alteration of potential rare plant habitats and the alteration of plant communities adjacent to the right-of-way are two possible impacts. Since existing rights-of-way are used over most of proposed route, the potential

alteration of adjacent plant communities is negligible. However, caution should be taken to avoid disturbing adjacent plant communities along the following link miles: the first 4 miles of link 42F; miles 1, 3, 6, 9, 10, 14, 17 and 20 along link 81; miles 1, 10, and 11 along link 83; and miles 1, 17, and 18 along link 86. Impact on potential rare plant habitat is moderate throughout the proposed route, although ledges exhibiting potential rare plant habitat qualities crossed at mile 9 along link 81 and miles 1, 4-7, 10-12, and 19-21 along link 86 are of special concern. (See pp. 3-25 and 3-26, Appendix E to DOE 1978 EIS, for list of potential rare plants native to cliffs.)

3.08 Wildlife

Impacts on the preferred habitat of "most harvested species," "species of special concern," and "all species" will be negligible. The magnitude and duration of all impacts on habitat will strongly depend on the vegetation maintenance procedures used and the specific ecological factors now limiting the wildlife populations along the proposed route. In particular, the most significant impacts on wildlife will be short-term disturbance, by construction activity, of a few species (particularly hawks, golden and bald eagles, great horned and barred owls, and eastern cougar) breeding in and adjacent to the right-of-way. (See Table 4-7, "During Construction Disturbance" column, in Appendix E to DOE 1978 EIS.) Table 3.08-1 shows that approximately two-thirds of the route will have a high disturbance probability. However, the effect of any disturbance on sensitive wildlife along the proposed route will probably be relatively moderate.

TABLE 3.08-1. - DISTURBANCE PROBABILITY 1/
PROPOSED ROUTE: MOORE-WEBSTER

	IMPACT LEVELS				
	1 (Slight)	2 (Low)	3 (Moderate)	4 (High)	5 (Severe)
Miles	---	---	---	44.7	29.1
Percent	---	---	---	61	39

1/ Reference: Ecological Resources Impact Study, Appendix E to this Supplement.

An important wildlife feature near this route is an active reintroduction site where the peregrine falcon, a threatened species, bred in 1976-79. Although the nest site itself is well outside the route, the U.S. Fish and Wildlife Service, in cooperation with landowners and the White Mountain National Forest, has delineated boundaries of an area it considers potential "critical habitat" for this species, and these boundaries come within a mile of the route. U.S. Fish and Wildlife Service is currently considering incorporating several wetlands, including some intersected by the proposed centerline, in the area it considers potential "critical habitat" for the peregrine. Also, a

few sites where peregrines formerly nested and/or where U.S. Fish and Wildlife Service is currently planning releases of peregrines in the next few years, are located within a mile of the route.

Overhead ground wires present a very minimal collision hazard, due to the falcon's acute eyesight and excellent manueverability. The peregrine could be adversely impacted by herbicide. However, it might benefit from increased prey associated with forest successional changes induced by the right-of-way. On the whole, it is unlikely that the facility will impact the peregrine significantly either negatively or positively. Any adverse impact on the falcons would be minimized if construction and maintenance activities for this section are controlled during June and July, the breeding season. Control of the use of herbicides in this area would also effectively minimize impacts. If the facility is to be constructed, the DOE will continue to consult with the U.S. Fish and Wildlife Service, as required by the Endangered Species Act, to develop any further impact assessment and to develop appropriate mitigative measures if they are required.

The most important link miles in terms of impact on wildlife through habitat change and disturbance are mile 1 along link 42F, miles 2,3,6,8,16 and 21 along link 81; miles 7,8 and 9 along 83; and, miles 14,25 and 27 along link 86.

3.09 Socioeconomic Impacts

Both general and region-specific socioeconomic impacts were identified with respect to both the short-term (construction impacts) and the long-term (operational impacts) and were discussed primarily in terms of non-compatible land uses, esthetics, and community values. For the short-term analysis, it was assumed that labor would be 80 percent local (State of New Hampshire-based) for the survey and clearing phase and 50 percent local for the construction phase; and, that the average hourly wage would equal $13.00. Also see the Socioeconomic Impact Study, Appendix H to this Supplement.

3.09.1 General Impacts

Through the operational life of the proposed facilities, the esthetic changes of additional land clearing and new transmission lines may have impact on property values and the recreation industry (see Visual-Recreation Resources Impact Study, Appendix I to this Supplement). Although property owners are compensated for land used in right-of-way clearing, other property owners within the viewshed are not. These impacts are dependent on the esthetic component of individual viewshed property values. There may also be some radio and television reception interference at sites close to the proposed lines. Total property tax losses would be minimal. Socioeconomic impacts are summarized in Table 3.09-1.

TABLE 3.09-1. - REGIONAL SUMMARY OF SOCIOECONOMIC IMPACTS 1/
PROPOSED ROUTE: MOORE-WEBSTER

Types of Impacts	Comments
-Employment	Total employment will be 120 people for 100,000 man hours. Opportunities for local labor will be about 54 people.
-Income	Gross wages will be about $1.3 million, with approximately $585,000 to local labor. Anticipated retail sales are $315,000.
-Tax Loss	Annual $46 yield tax loss. The proposed facilities will be tax exempt.
-Residential	Severe impact to one residence at mile 29.6 of link 86.

1/ Reference: Socioeconomic Impact Study, Appendix H to this Supplement.

3.09.2 Region Specific Impacts

Since the proposed route involves expansion of existing rights-of-way only along its last 4.5 miles, most impacts will involve gaining access to the right-of-way during the construction phase. Potential damage to local roads may be high for links 81 and 86, and moderate for links 41F, 42F, and 83. Potential conflicts with local traffic is high for link 83, and moderate for the other links.

Viewshed impacts on adjacent residential areas will be high along links 41F and 42F, which require the construction of 165-foot double-circuit steel towers. There will be a severe impact to one residence at mile 29.6 along link 86. Socioeconomic impacts are summarized by link in Table 3.09-2.

3.10 Existing Land Use

Compatibility of land use with the transmission line was the primary basis for evaluating impacts. Five impact levels were used: severe, high, moderate, slight, and not identifiable. There are potentially severe impacts at mile 29.6 of link 86 where a house is located within the proposed right-of-way expansion. The only other significant land use impact is the removal of approximately 45 acres of forest cover in order to widen the right-of-way for the last 4.5 miles of link 86. Also see the Land Use Impact Study, Appendix G to this Supplement.

Table 3.09-2
SOCIOECONOMIC IMPACTS BY LINK 1/

Subregion	Link No.	Link Length Miles	Short-term impacts: Access Roads Miles 2/	Potential Road Damage 3/	Traffic Conflicts	Residential Relocation (No. Trailers)	Residential Relocation (No. Houses)	Forestry (Acres)	Agric. land (Acres)	Conflicts with Local Concern	Viewshed Impacts 6/
VI - A	41F	0.3	0.5	M	H	--	--	--	--	--	H
VI - A	42F	6.2	13.2	M	M	--	--	--	--	--	H
VI - A	81	24.9	5.0	H	M	--	--	--	--	--	S
VI - B	83	12.3	2.4	M	H	--	--	--	--	Rumney	S
VI - C, VII	86	30.1	6.0	H	M	0	1	45.9	4.9	--	S

1/ Reference: Socioeconomic Impact Study, Appendix H to this Supplement

Short-term impacts: During preconstruction and construction work only.

2/ Access roads: Estimated mileage based on estimates on quality of existing access as provided by the Department of Energy (DOE)

3/ Potential road damage: High (H) - limited secondary roads available - no four land roads available.
Moderate (M) - network of secondary roads - no four lane roads available.
Slight (S) - four lane roads - network of secondary roads.

4/ Traffic conflicts: same as for 2/ plus: High (H) - tourist area, sightseeing a major recreation activity.
Moderate (M) - limited secondary roads local traffic.
Slight (S) - four lane roads, tourism.

5/ Residential relocation - includes only those residences within proposed right-of-way that parallel existing right-of-way.

6/ Viewshed impact: High (H) - esthetic value of area high - proposed change increases viewshed.
Moderate (M) - esthetic value high - changes do not extend viewshed.
Slight (S) - existing development, viewshed not extended.

3.11 Proposed Land Use

Impacts on proposed land use would be negligible, primarily because the proposed route is located between two existing steel tower lines within an existing, cleared right-of-way.

3.12 Recreation Impacts

The use of existing right-of-way over most of the proposed route greatly reduces the recreational resource impacts. Recreational viewer impacts were deemed low since the potential viewer(s) would observe the proposed facilities in a setting with the existing transmission lines and towers. Preemptive impacts to recreational resources were also primarily low since only existing linear features are affected. Even along the section of the proposed route requiring additional right-of-way clearing (link 86 from Boston Hill to the Webster Substation), the majority of the impacts assigned were low. This proposed right-of-way is relatively devoid of recreational resources.

Both preemptive and recreational viewer impacts are summarized for the proposed route in Table 3.12-1. Also see the Visual-Recreation Resources Impact Study, Appendix I to this Supplement.

TABLE 3.12-1. - RECREATION IMPACTS
PROPOSED ROUTE: MOORE-WEBSTER 1/

	Preemptive Impacts		Recreational Viewer Impacts	
Impact Levels	Number of Occurrences	Percent	Miles with Impacts	Percent
None	35	31.5	7	9.7
Low	74	66.7	58.6	81.6
Moderate	2	1.8	2.2	3.1
High	--	--	4	5.6
Severe	--	--	--	--

1/ Reference: Visual - Recreation Resources Impact Study, Appendix I to this Supplement.

3.12.1 Preemptive Impacts

Almost all preemptive recreational impacts assigned along the proposed route were low. The Appalachian Trail and its proposed relocation are the exception. Moderate impacts were assigned these features where they would be crossed by the proposed route along link 83. In the area requiring a clearing of new right-of-way (along link 86 between Boston Hill and the Webster Substation), only two recreational resources were crossed. Both were assigned low impacts.

Most frequently impacted were linear recreational features including the aforementioned Appalachian Trail, potential State-designated Scenic or Recreational Rivers, and recreational highways (used as fall-foliage, scenic, sightseeing, or bicycle routes). Important "recreational" highways crossed by the proposed route include Routes 135, 302, 25, 25A and 104. Important potential State Recreational or Scenic Rivers crossed by the proposed route include the Ammonoosuc River (used for fishing and canoeing), the South Branch of the Baker River, and the Smith River. Links 81 and 83 also traverse portions of the White Mountain National Forest and its Proclamation Area. In these areas, low impacts were assigned due to the presence of the existing right-of-way.

3.12.2 Recreational Viewer Impacts

The most significant viewer impact features of the proposed transmission facilities occur along the route's shortest links: 41F and 42F. Here, the proposed facilities include double-circuit steel towers 165 feet high. As such, they would be visible from the Moore and Comerford Reservoirs, both important recreational water bodies. High and moderate impacts were assigned along these links. At the opposite end of the proposed route, a moderate impact was assigned mile 30 of link 86 where the proposed right-of-way extension would be viewed from a small ski area on Flag Pole Hill and Routes 3A and 11, both State-designated bicycle routes.

All other recreational viewer impacts are low, reflecting the limited visual impact which would result by using the existing right-of-way. The middle portion of the proposed route, including link 83 and portions of links 81 and 86, is the route's most frequently viewed section. Here, recreational users associated primarily with the White Mountain National Forest would view the proposed facilities.

3.13 Visual

The location, construction, and maintenance of the proposed transmission lines will have varying degrees of visual impact. These impacts will depend on the facilities' compatibility with their surroundings, the scenic quality of the area, the screening provided by terrain and vegetative cover, and the design of the structures, access roads, and right-of-way. Impacts will also depend on the number of viewers at any given point, their distance from the line, their activity at the time of viewing, and their subjective reaction to the scene. Three categories of impact have been identified: viewer impacts, landscape quality impacts, and site attractiveness impacts. All three impact categories are summarized in Table 3.13-1. Also see the Visual-Recreation Resources Impact Study, Appendix I to this Supplement.

TABLE 3.13-1. - VISUAL IMPACTS 1/
PROPOSED ROUTE: MOORE-WEBSTER

		IMPACT LEVELS				
		1 (None)	2 (Low)	3 (Moderate)	4 (High)	5 (Severe)
Landscape Quality:	(Miles)	3.9	34.2	34.5	1.0	0.2
	(Percent)	5.3	46.3	46.7	1.4	0.3
Site Attractiveness	(Miles)	69.3	0.1	3.8	0.5	0.1
	(Percent)	93.9	0.1	5.2	0.7	0.1
Viewers	(Miles)	---	63.8	6.0	4.0	---
	(Percent)	---	86.5	8.1	5.4	---

1/ Reference: Visual-Recreation Impact Study, Appendix I to this Supplement.

3.13.1 Viewer Impacts

Average viewer impacts are relatively uniform throughout the proposed route. As all links involve right-of-way sharing, low impacts predominate. They are assigned along 63.8 miles of 73.8 miles of the proposed route. Higher double-circuit steel towers along parts of link 42F by the Connecticut River and Moore Reservoir will have significant impact on recreation viewers. Other significant viewer impacts occur in the vicinity of Boston Hill, along the eastern slope of Flag Pole Hill, and at the Chance Pond Brook crossing, due to the proposed right-of-way expansion along the southern portion of link 86.

3.13.2 Landscape Quality Impacts

Landscape quality impacts are generally low to moderate along the proposed route. These low values reflect the extremely high landscape absorption conditions found within an existing right-of-way for a wood pole facility which does not significantly surpass the existing facilities in size and does not require right-of-way expansion.

3.13.3 Site Attractiveness Impacts

Generally, there are no site attractiveness impacts. This reflects the proposal to occupy an existing transmission right-of-way from the Moore Substation to Boston Hill along link 86, and to parallel an existing right-of-way for 4.5 miles from Boston Hill to the Webster Substation. Site attractiveness impact values of "none" are assigned for 69.3 miles; "low" impact values, for 0.1 miles; "moderate" impact values for 3.8 miles; "high" impact values, for 0.5 miles; and, "severe" impact values, for 0.1 miles. The "severe" impact is assigned along mile 30 of link 86 where Chance Pond Brook would be crossed.

3.14 Forest Resources

The proposed route would require the removal of approximately 45.8 acres of forest along the 4.5 miles of link 86 from Boston Hill to the Webster Substation. This would result in the annual loss of approximately 30 cords of roundwood, which represents $465.00 in stumpage value and $46.00 in tax revenue.

3.15 Cultural Resources

Both direct (right-of-way) and indirect (visual intrusion) impacts caused by the construction, operation, or maintenance of the proposed transmission line were considered. Three types of cultural sites are distinguished: archeological (below-ground historic and prehistoric sites), historic (standing structures and above-ground historic resources), and cemeteries. Indirect impacts were considered as an inverse function of distance: sites 0.0 to 0.3 miles from the centerline were assigned "high" indirect impacts; sites 0.4 to 0.6 mile were assigned "moderate" impacts; and, sites beyond 0.7 miles were assigned "low" impacts.

Also see the Historical-Archeological Impact Study, Appendix J to this Supplement.

3.15.1 Historic Resources

No historic resources will be directly affected. Additional visual impact would be virtually eliminated by construction of visually compatible transmission lines between existing ones. The present lines have already created impacts, and these prior impacts will probably not be altered by adding lines down the middle.

3.15.2 Archeological Resources

A direct impact will occur to what appears to be the remains of an old stone wall of a foundation adjacent to a stream within the link 83 right-of-way. It may be a mill remnant, but this could not be determined. Mitigation for recovering data or relocation of the proposed facilities may be necessary.

3.16 Electrical Effects

Electrical effects of the proposed facilities are discussed in the initial transmission draft EIS on pages 3-124 to 3-133. The effects discussed include audible noise, electromagnetic interference, field effects, oxidants, and electrical hazards.

There will be very little public exposure to the line, especially along the western portion, as the facility is located in the center of a 350-foot right-of-way. The 4.5 miles of line between the large right-of-way and the Webster Substation parallels an existing line. Adjacent land uses include rural residential, farmland, and forest production. In total, 1 trail (Appalachian Trail) and 42 highways and roads will be crossed by the facility.

Section 4

Mitigation Measures Included in the Proposed Action

4.0 MITIGATION MEASURES INCLUDED IN THE PROPOSED ACTION

Section 4 of the DOE draft EIS, published in April 1978, lists certain measures to mitigate environmental impacts if the proposed transmission facilities are constructed. Those measures, which are not site specific, apply equally well to this supplemental proposal, except for measures involving location or relocation of the centerline to avoid a particular impact. Since the primary advantage of this proposed supplemental route is its utilization of an existing right-of-way, the opportunity for impact avoidance through relocation will be rare--but, fortunately, so will the need. It is difficult to improve on a location between two existing lines, in the center of a cleared right-of-way which has been established for 50 years. However, the last 4.5 miles do present an opportunity for relocation, either by deviating from parallel or by crossing to the other side of the existing 115-kV line. These options will be considered in final centerline siting and design.

In addition, because there will be no new access roads, mitigation techniques for such construction in the April 1978 draft do not apply to this segment.